

Olives, olive oils and their by-products: using a lipidomic platform for providing a molecular fingerprint of value-added foodstuff and valorisation of their industrial waste

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Olives (*Olea europaea* L.) and olive oil have been used for millennia in the diet of Mediterranean populations, and their consumption is associated with several health benefits. At the Mass Spectrometry Centre, we have been developing lipidomic-based methodologies to solve the main problems faced by the olive and olive-derived products' industries, such as the detection of fraud and adulteration, the traceability, and the identity of origin of olives and olive oil. Using mass spectrometry (MS)-based tools, we aim to propose a chemical ID card both for olives and virgin olive oils. We also aim to provide a new insight into the bioprospection of olives and olive oil for their exploitation as high value-added foodstuff to be used in healthy diets. Likewise, we aim to foresee the sustainable reuse of solid wastes (pulp, seeds, kernels), which is key to value these industrial by-products as sources of bioactive lipids.

Lipid phenotyping using MS-based tools has shown that each virgin olive oil has a unique lipid fingerprint [1]. Besides, hundreds of compounds have been identified

in the lipidome of the olive pulp[2,3] and seed [4] from the Portuguese olive variety Galega, including triacylglycerols and polar lipids.

Different projects are ongoing for optimising the identification of the lipid markers that will represent the unequivocal molecular ID card for the Portuguese olives and top-quality olive oils. The chemical phenotyping will be used to value table olives and olive derivatives as privileged foods with high nutritional value, alerting the final consumers, making them more informed and demanding on their quality. These aims consider the different dimensions of sustainable development underlying the goals of the United Nations' Agenda for 2030.

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FIGURE 1

Different targets of mass spectrometry-based lipid phenotyping of olives, virgin olive oils and olive-derived industrial by-products.



References

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